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Exploring potential inhomogeneities induced by large deformation in polymer glasses[1] XIAOXIAO LI, YEXIN ZHENG, MESFIN TSIGE, SHI-QING WANG, Department of Polymer Science, University of Akron — Non-polymeric organic glasses rarely yield during external deformation. In contrast, polymeric glasses of high molecular weight can always undergo ductile deformation during which segmental mobility greatly increases [1]. We carried out molecular dynamics simulation based on a coarse-grained model [2] to investigate how polymeric glasses of high and low molecular weights respond differently to large deformation. In both uniaxial extension and simple shear, we observed inhomogeneous responses, e.g., spatially varying segmental mobility and strain localization. The presentation reports such inhomogeneities at different temperatures and rates for both long and short chain systems. [1] Bending, B.; Christison, K.; Ricci, J.; Ediger, M. Macromolecules 2014, 47, (2), 800-806. [2] Hsu, D. D.; Xia, W.; Arturo, S. G.; Keten, S. Macromolecules 2015, 48, (9), 3057-3068.

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